



STATE OF UTAH  
NATURAL RESOURCES  
Oil, Gas & Mining

Scott M. Matheson, Governor  
Temple A. Reynolds, Executive Director  
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4241 State Office Building • Salt Lake City, UT 84114 • 801-533-5771

April 3, 1984

Mr. Bob G. Donegan, Vice President  
Quintana Minerals Corporation  
7591 E. Maplewood Ave. Suite 114  
Englewood, Colorado 80111

RE: Permitting  
Syntana-Utah Project  
Cowboy Canyon Mine  
ACT/047/021  
Uintah County, Utah


Dear Mr. Donegan:

The Division has reviewed the information submitted by Quintana Minerals Corporation on November 22, 1983, in response to the preliminary mine plan review of March 2, 1983. The review team has found that there is still some information lacking that is necessary for a complete application. This information is detailed in the attached pages.

When an adequate response to this review has been received, the Division will publish a notice of tentative approval of the mine plan in a newspaper of general circulation in the locality of the proposed mine. If, after 30 days no adverse public comments have been received, and the surety has been arranged, the Board of Oil, Gas and Mining will review the application and final permit approval may be granted.

Please contact me or Jim Smith with any questions or concerns.

Sincerely,

  
Susan C. Linner  
Reclamation Biologist

SCL/jvb  
81940

cc: Jim Bradley, Utah Energy Office  
Jim Smith, DOGM  
Tom Portle, DOGM  
Dave Darby, DOGM  
Pam Grubaugh-Littig, DOGM

Enclosures

## MRP REVIEW

Syntana - Utah Shale Oil Project  
Cowboy Canyon Mine  
ACT/047/021, Uintah County, Utah

### Rule M-3 - DWD

Cross sections and plans for ponds 1, 8 and 9 should be submitted 60 days prior to construction. Dams should be sized to contain the expected sediment loads along with the runoff events. Sizing calculations should be submitted for all culverts. Will a culvert be used where the road crosses the natural drainage above pond 9?

### Rule M-3(5)(c) - CY

The information provided concerning the plugging of drill holes is insufficient to determine if the proposal meets the requirements of the Division. Attached is a copy of the Division's plugging guidelines. The applicant should review these guidelines and relate to the Division whether the current proposal meets the specification as stated in these guidelines.

### Rule MR-5 - PGL

Please explain how the costs per acre were derived.

The phase I will be bonded entirely because the mine and plant are interdependent. The operator proposes a bond estimate of almost \$20 million. The State of Utah, DNR-DCGM presently accepts a surety bond, irrevocable letter of credit, U. S. Treasury Notes, cash, automatically renewed certificates of deposit and contracts. The operator may choose the form of surety. The contract (self-bond) must be approved by the Board of Oil, Gas, and Mining. Upon choosing the form of surety or if there are questions, please contact the Division.

### Rule M-10 - DWD

Sedimentation ponds shall be the last structures to be reclaimed unless alternative reclamation plans are submitted.

### Rule M-10(6) Waste Rock and Toxicity - TLP

In response to the Division question regarding unsuitability of various overburden and waste rock materials the applicant responds on page 82 that potential unsuitability will be determined by "chemical analysis for toxicity to plant growth." The applicant should be more specific as to what parameters will be scrutinized for and how this will be accomplished. The applicant may wish to consult with the Division on these points.



Rule M-10(12) - SCL

The applicant has committed to submit updated reclamation plans for each specific disturbed area 90 days prior to initiation of final reclamation on each area. The applicant should also commit to provide the Division with any proposed changes in test plot design, monitoring methods for test plots or reclaimed areas, interim reclamation plans, and methods used to protect reclaimed areas, at least 60 days prior to planned implementation.

Rule M-10(14) Soil Maps and Stripping - TLP

While the applicant has provided soil maps to show sample points (figure 14) these points must be identified and related to the laboratory data found in the Soil Inventory in Appendix ii.

How will the isopach map (Figure 13) be translated to field use; will areas be staked or flagged to indicate removal depths to equipment operators?

Rule M-10(14) Tests Plots and Topsoil Redistribution - TLP

The applicant describes general techniques to be employed on test plots on page 62-64 and shows a plot plan on page 65. While the plots are proposed to be divided into 2 sections to test methods on both general disturbed and spent shale the design is not correlated with the use of Tosco fine shales combined with Superior coarse shales. This was the crux of concerns brought up in rule M-10(14) Soil Redistribution. The design should be revised to establish that this combination proposed for use as a subsurface to redistribute topsoil will or will not result in convective or diffusive movement of salt into the topsoil (thus decreasing its ability to support vegetation.) This should be established by soil testing adequate to measure salt and sodium levels in topsoil and any changes over time.

In addition, the applicant should acknowledge that soil redistribution should not occur when soils are too moist. This will prevent damage to soil structure.

Rule M-3(5) has been amended as of January 28, 1982, to read as follows:

Rule M-3(5)(c) - Affected Section

(c) The plugging program for all drill holes.

1. All drill holes 2 1/2 inches or larger in diameter at the surface shall be plugged in the subsurface with material suitable in the discretion of the Division, to prevent the migration of water, gas, oil or other substances from one strata to another.
2. Irrespective of any water, oil, gas or other potential migratory substance found, all drill holes shall be plugged at the surface with a plug consisting of at least five feet of cement. Other methods given prior approval by the Division may be used if such site specific or procedure specific exceptions are warranted.

Rule M-3(5)(d) - Affected Section

(d) The reclamation plans for all ground disturbances related to the operation. All ground disturbances not having continuing postoperation use shall be reclaimed in such a manner compatible with local conditions as approved by the Division.

Report form MR-9 shall be filed with the Division for all mineral exploration work undertaken and approved within the limits of this rule. It shall not be filed in lieu of reporting requested under Rule M-8.

All drill holes made as step outs to an initial proposed drilling program should be described as in (a) through (d) above to the Division as soon as possible. The additional information may be filed as an addendum to the original notice and will not require approval.



STATE OF UTAH  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF OIL, GAS AND MINING  
4241 State Office Building  
Salt Lake City, Utah 84114

GUIDELINES FOR PLUGGING MINERAL TEST HOLES  
WHICH ENCOUNTER FLUIDS  
(Revised January 1, 1982)

The contents of this document are suggestions to operators for compliance with Rule M-3(5) of the General Rules and Regulations pursuant to the Utah Mined Land Reclamation Act of 1975, Title 40-8, UCA 1953, as amended. Rule M-3(5) requires that holes drilled for mineral exploration or seismic exploration be plugged at the surface and in the subsurface to prevent the migration of fluids from one strata to another. This document attempts to establish recommended procedures for compliance with the plugging requirements when ground water is encountered. These procedures are not specifically mandatory and may be adapted by any operator to his situation as long as compliance with Rule M-3(5) is achieved.

The operator is responsible for preventing the interstrata migration of fluids in holes drilled by or for him. If a hole is producing water, or if oil and/or gas shows are encountered, or if a known aquifer is penetrated, the use of downhole plugging procedures sufficient to prevent the interstrata migration of fluids or to protect the integrity of the aquifer must be initiated. Sections 1 through 4 listed below provide minimum standards or methods acceptable to the Division which may be applied. If the operator can demonstrate that the water encountered is not of sufficient quantity or quality for potential use and that no interstrata migration is possible, he may choose to place only a permanent surface plug, or other means as given in prior approval by the Division on a site specific basis. In any case, he should report, as described in #6 below.

1. Plugging Mud

To seal off water bearing formations, the driller should mix in the mud suction pit or a tank a commercial grade, high quality sodium bentonite, including any necessary conditioners, in order to produce a plugging mud. The plugging mud should have the following characteristics:

- (A) It should be thoroughly mixed and uniform in consistency.
- (B) It should contain no chemicals or substances which have a strong objectionable odor or taste or any substances that may decompose in the hole to produce objectionable odors or tastes.
- (C) The liquid phase of mud should be non-saline water with no oil or other soluble substances that would be toxic if ingested in the concentrations present in the liquid phase.
- (D) No flocculating agents should be used.

- (E) The marsh funnel viscosity of the mud should be read and the viscosity raised by gradual additions of the dry peptized bentonite. If fresh mud is being mixed (water and bentonite), the marsh funnel viscosity of the slurry should be raised to a minimum of 50 seconds. If bentonite is being added to drilling mud, the viscosity of the plugging mud should be raised to 50 seconds. The 10 minute gel strength of the mud should be at least 20 lbs/100 sq ft and would be achieved, in most cases, if the above specifications are followed.
- (F) The filtrate should measure 13.5 cc on an API standard filter test. This will also be achieved if the above is followed.

The practice of thickening polymer-only drilling fluids is not an acceptable plugging method. Standard abandonment fluid products available on the market are acceptable for plugging drill holes

## 2. Cementing

If the use of plugging muds to seal off water bearing formations is ineffective, the hole should be plugged with cement, adequately to isolate the water bearing zone(s). The cement mix should consist of API Class A or H cement with additives as needed. It should be of a weight of at least 13.5 lbs/gal and should be designed and placed under the supervision of a qualified professional in drill hole cementing, particularly if packers are required.

## 3. Injection

The plugging medium should be pumped through the drill string to the bottom of the hole. Enough plugging medium should be pumped to totally displace the drilling fluid in the hole and to fill the hole to the top. The plugging medium returns should be rechecked for the properties listed in #1 or #2 above. After the drill string is removed, the hole should be filled with excess plugging medium to a depth of about 10 ft. Cuttings may be disposed of down hole.

## 4. Surface Plug

After the hole is plugged with plugging medium, a cement surface plug should be placed. The surface plug should be made of cement or a mixture of cement and bentonite and be at least five feet in length. The top of the cement plug should be brought up to the casing top or ground level. If the area is tilled farmland, the top of the casing and surface plug should be three feet below the ground surface and covered by soil. No monument is required. A permanent surface plug should be placed in all holes (dry holes included) that will not allow caving. If cemented casing is to be left in place, a concrete surface plug is not required if a permanent cap is secured onto the casing top.



## 5. Reclamation

Immediately after the drill site is abandoned, all trash and debris should be removed. Any remaining cuttings piles and mud pits should be buried and regraded to natural contours as soon as practicable. If the site was bladed when constructed, the surface should be scarified, broadcast-seeded and ripped or dragged to cover the seed. Mulch and/or fertilizer may be needed in some cases. Other pertinent surface disturbances should also be reclaimed as necessary. The Division or surface management agency should be contacted for recommended seed mixtures and rates of application.

## 6. Reporting

The pertinent information relating to the water bearing formations encountered in wet holes should be submitted to the Division at the completion of a project or at least annually. The information to be submitted for each hole or series of holes, should be provided on Form MR-9 which may be obtained from the Division.

## 7. Recordation

The operator is responsible for the proper plugging of holes drilled by or for him. If the Division finds that a hole has been improperly abandoned, it will seek to have the responsible operator re-enter and plug said hole. The full authority of the Board of Oil, Gas and Mining is defined in 40-8-7 and 40-8-8 of the Mined Land Reclamation Act and will be utilized to determine that holes are properly plugged and disturbed land reclaimed. The operator is encouraged to retain clear and accurate records of drilling, logging and plugging of holes and reclamation for at least two (2) years.

## 8. Temporary Abandonment

Drill holes required for future assessment by the operator should be appropriately conditioned and capped. If a hole is to be converted to a water well, it must be cased, conditioned and fitted with a secure surface cap. These holes should be reported to the Division as per #6 above. Holes which are to be converted to water wells must be turned over to the subsequent owner with a written, contractual release which would clearly describe the transfer of responsibility for the hole and the conditions as received. The State Division of Water Rights must be contacted ([801] 533-6071). The subsequent owner would then be responsible for the appropriation of the water and the condition of the well. Copies of such contracts must be submitted to the Division.